US010728649B1

(12) **United States Patent**
Holman

(10) **Patent No.: US 10,728,649 B1**
(45) **Date of Patent: Jul. 28, 2020**

(54) **MULTIPATH AUDIO STIMULATION USING AUDIO COMPRESSORS**

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventor: **Tomlinson Holman**, Cupertino, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 56 days.

(21) Appl. No.: **15/990,033**

(22) Filed: **May 25, 2018**

Related U.S. Application Data

(60) Provisional application No. 62/511,844, filed on May 26, 2017.

(51) **Int. Cl.**
H04R 1/10 (2006.01)
H03G 5/16 (2006.01)
H04R 3/14 (2006.01)

(52) **U.S. Cl.**
CPC ***H04R 1/1091*** (2013.01); ***H03G 5/165*** (2013.01); ***H04R 1/1016*** (2013.01); ***H04R 1/1041*** (2013.01); ***H04R 3/14*** (2013.01); *H04R 2460/13* (2013.01)

(58) **Field of Classification Search**
CPC .. H04R 1/1091; H04R 1/1016; H04R 1/1041; H04R 3/14; H04R 2460/13; H03G 5/165
USPC 381/74, 151, 380, 374, 106, 104; 704/500, 501, 502, 503, 504
See application file for complete search history.

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Primary Examiner — Vivian C Chin
Assistant Examiner — Con P Tran
(74) *Attorney, Agent, or Firm* — Robert C. Kowert; Kowert, Hood, Munyon, Rankin & Goetzel, P.C.

(57) **ABSTRACT**

An apparatus for delivering audio signals to a user includes an air-conduction transducer and a bone-conduction transducer. The air-conduction transducer is configured to convert a component of the audio signals to air vibrations detectable by an ear of the user. The bone-conduction transducer is configured to convert another component of the audio signals to vibrations in a cranial bone of the user via direct contact with the user. The apparatus employs one or more filters to separate input audio signals to produce a high-frequency component, a mid-frequency component, and a low-frequency component. The mid- and low-frequency components are processed using compressors to reduce the dynamic range of the components, and then combined to produce a combined component. The combined component is delivered to the user through the bone-conduction transducer, and the high-frequency component is delivered to the user through the air-conduction transducer.

20 Claims, 7 Drawing Sheets